

What is claimed is:

1. A pipe shoe for supporting a pipe from a pipe rack or other structural support, the pipe shoe comprising:

5 a generally horizontal base plate for sliding engagement with the pipe rack or other structural support in response to thermal expansion of the pipe;

a left-side support plate and a right-side support plate each affixed to and extending generally upward from the base plate, the right-side support plate including a right-side support plate port;

10 a curved lower plate affixed to and supported on both the left-side support plate and the right-side support plate, the curved lower plate being configured for supporting the pipe;

a curved upper plate including a left-side lower end and a right-side lower end for positioning about the pipe;

15 a left-side attachment member for attaching the left-side lower end of the upper plate to the left-side support plate; and

an attachment mechanism for securing the right-side lower end of the upper plate to the right-side support plate, the attachment mechanism including a right-side bolt passing through a hole in the right-side lower end of the upper plate and the right-side support plate port, at least one of the right-side hole and the right-side port being oversized with respect to the right-side bolt to permit the right-side bolt to pass through the hole and the port, and the curved upper plate is pulled toward

the base plate to place the right-side bolt in both tension and shear when the right-side bolt is tightened.

2. The pipe shoe as defined in Claim 1, wherein the right-side support plate is angled with respect to a plane perpendicular to a plane of the base plate.

3. The pipe shoe as defined in Claim 2, wherein the right-side support plate is angled away from the centerline of the pipe, such that tightening the right-side bolt pulls the right-side lower end of the upper plate toward a lower portion of the pipe.

4. The pipe shoe as defined in Claim 3, wherein the right-side support plate is angled at from  $1^{\circ}$  to  $5^{\circ}$  with respect to the plane perpendicular to the base plate.

5. The pipe shoe as defined in Claim 1, further comprising:  
a left-side support plate port, a left-side bolt, and a left-side support plate hole in the left-side lower end of the upper plate.

6. The pipe shoe as defined in Claim 5, wherein the left-side support plate is positioned radially inward of the left-side lower end of the upper plate, and

the right-side support plate is positioned radially inward of the right-side lower end of the upper plate.

SUS  
AB

7. The pipe shoe as defined in Claim 1, wherein the curved lower plate is configured for planar engagement with the pipe along a circumferential length of 5 from 90° to 160°.

8. The pipe shoe as defined in Claim 1, wherein each of the curved lower plate and curved upper plate have an arcuate interior surface with a radius substantially conforming to an exterior surface of the pipe.

9. The pipe shoe as defined in Claim 1, further comprising:
- 10 a front left-side support plate and a front right-side support plate each secured to the base plate;
- a rear left-side support plate and a rear right-side support plate each affixed to the base plate; and
- the curved lower plate extends axially from the front support plates to the rear
- 15 support plate.

10. The pipe shoe as defined in Claim 9, further comprising:  
a curved front upper plate for engagement with the front support plates, and  
a curved rear upper plate for engagement with the rear support plates.

Sub  
A4

5 11. A pipe shoe for supporting a pipe from a pipe rack or other structural support, the pipe shoe comprising:

a generally horizontal base plate for sliding engagement with the pipe rack or other structural support in response to thermal expansion of the pipe;

10 a left-side support plate and a right-side support plate each affixed to and extending generally upward from the base plate and angled away from the centerline of the pipe with respect to a plane perpendicular to the base plate, the right-side support plate including a right-side support plate port and the left-side support plate including a left-side support plate port;

15 a curved lower plate affixed to and supported on both the left-side support plate and the right-side support plate, the curved lower plate being configured for supporting the pipe;

a curved upper plate including a left-side lower end and a right-side lower end for positioning about the pipe; and

20 an attachment mechanism for securing the right-side lower end of the upper plate to the right-side support plate and the left-side lower end of the upper plate to the left-side support plate, the attachment mechanism including a right-side bolt

A4  
passing through a hole in the right-side lower end of the upper plate and the right-side support plate port, and a left-side bolt passing through a hole in the left-side lower end of the upper plate and the left-side support plate, such that the curved upper plate is pulled toward the base plate by tightening the right-side bolt and the  
5 left-side bolt.

12. The pipe shoe as defined in Claim 11, wherein the right-side support plate is angled at from  $1^{\circ}$  to  $5^{\circ}$  with respect to the plane perpendicular to the base plate, and the left-side support plate is angled at from  $1^{\circ}$  to  $5^{\circ}$  with respect to the plane perpendicular to the base plate.

10 13. The pipe shoe as defined in Claim 11, wherein the left-side support plate is positioned radially inward of the left-side lower end of the upper plate, and the right-side support plate is positioned radially inward of the right-side lower end of the upper plate.

14. The pipe shoe as defined in Claim 11, wherein the curved lower plate  
15 is configured for planar engagement with the pipe along a circumferential length of from  $90^{\circ}$  to  $160^{\circ}$ .

15. The pipe shoe as defined in Claim 11, further comprising:  
a front left-side support plate and a front right-side support plate each  
secured to the base plate;  
a rear left-side support plate and a rear right-side support plate each affixed  
5 to the base plate; and  
the curved lower plate extends axially from the front support plates to the rear  
support plate.

16. A method of supporting a pipe from a pipe rack or other structural  
support, the method comprising:

10 providing a generally horizontal base plate for sliding engagement with the  
pipe rack or other structural support in response to thermal expansion of the pipe;

affixing each of a left-side support plate and a right-side support plate to and  
extending generally upward from the base plate, the right-side support plate  
including a right-side support plate port;

15 affixing a curved lower plate to and supported on both the left-side support  
plate and the right-side support plate, the curved lower plate being configured for  
supporting the pipe;

providing a curved upper plate including a left-side lower end and a right-side  
lower end for positioning about the pipe;

attaching the left-side lower end of the upper plate to the left-side support plate;

securing the right-side lower end of the upper plate to the right-side support plate by inserting a right-side bolt through a hole in the right-side lower end of the upper plate and the right-side support plate port, at least one of the right-side hole and the right-side port being oversized with respect to the right-side bolt to permit the right-side bolt to pass through the hole and the port; and

tightening the right-side bolt to pull the curved upper plate toward the base plate and place the right-side bolt in both tension and shear.

10 17. The method as defined in Claim 15, further comprising:

angling the right-side support plate with respect to a plane perpendicular to a plane of the base plate, the right-side support plate being angled away from the centerline of the pipe, such that tightening the right-side bolt pulls the right-side lower end of the upper plate toward a lower portion of the pipe.

15 18. The method as defined in Claim 15, further comprising:

providing a left-side support plate port, a left-side bolt, and a left-side support plate hole in the left-side lower end of the upper plate.

19. The method as defined in Claim 18, wherein the left-side support plate is positioned radially inward of the left-side lower end of the upper plate, and the right-side support plate is positioned radially inward of the right-side lower end of the upper plate.

SA 15

20. The method as defined in Claim 15, wherein the curved lower plate is configured for planar engagement with the pipe along a circumferential length of from 90° to 160°.

Add  
A2